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ABSTRACT

The purposes of this study were to test the predictability of the aspirational changes using the simple, two-state, discrete-time Markov model and to test for differences in selected background characteristics for students with different aspirational patterns. Data were from an ongoing study of an industrialized rural area. High School students were surveyed to monitor changes in attitudes, plans, and behavior from 1966 to 1971. Major findings were that there was a differential turnover between college and non-college plans, that students with a given level but different histories of aspirations were similar in selected background characteristics such as family status, significant others' support, and income aspirations, and that the two-state, discrete-time Markov model predicted the changes in educational aspirations for the students sampled. A major conclusion was that the assumption of aspirational stability was supported and the process appears to be Markovian in nature with one general process in operation over all the high school years. (PS)

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ABSTRACT

Although there have been many studies of educational aspirations, few have investigated the process of aspirational change over the high school years. The purpose of this study was to determine if this change could be described as governed by a Markov process. The results indicated that for the cohorts sampled the fit between the model and the data were good. In addition, the patterns of aspirations time were analyzed using tests of mean differences for selected background variables. The results suggest that parental support of college plans is an important determinant of aspirational change. The significance of this study is in pointing to the utility of viewing aspirations as a process where time is implicitly taken into account, and where past aspirations are an important determinant of future aspirations.

EDUCATIONAL ASPIRATIONS AS

A STOCHASTIC PROCESS

Although there have been an immense number of studies done of educational aspirations,[1] only recently has attention been directed toward the study of change in aspirations over time. Typically, however, such studies have not used longitudinal data, but have posited causal models using path analysis (Rehberg and Westby, 1967; Duncan, Haller, and Portes, 1968; Sewell, Haller, and Portes, 1969; Bayer, 1969; Hauser, 1969; Rehberg, Schafer, and Sinclair, 1970). While these models may be used to describe the patterns operating at any point in time, their use in describing patterns over time is an empirical question. These models make somewhat restrictive assumptions regarding knowledge of all the variables operating in the system, and unquestioned orderings of the causal linkages involved (Heise, 1969). For this reason understanding of the dynamic interdependence of the aspirational process awaits multivariate analysis using panel data (Rehberg et al., 1970).

An early attempt at delineating this process was a study by McDill and Coleman (1963). These investigators found differential change rates between college and non-college aspirations with different valuation of scholastic achievement and high school social status. Rather than using a correlational study, they tried to predict changes in aspirations between freshman and senior year using a four-state, continuous-time Markov model. For their data they found good fit between predicted change and actual change using this model.

Somewhat more recently path analysis models have been used to investigate the aspirational process. Rehberg and Hotchkiss (1972) found in their study of freshman and sophomore aspirations that early aspirations were a type of "end product" of ability and family influences. In addition, they found that early aspiration level itself was an important determinant of significant others' influence and later aspirations. Williams (1972) in his study of effects on tenth and twelfth grade aspirations also found that early aspirations were an important determinant of later aspirations. In his study early aspirations influenced later teacher and parental expectations. These in turn produced the greatest effect on later aspirations.

The Markov model and the path analysis model, while both used to analyze change in aspirations, differ in their assumptions. The path model, since it is based on multivariate techniques, is restricted to assuming that the data are at least ordinal (although treated as interval). The Markov model, on the other hand, can be used to study dichotomous data. The path model assumes that the system operates in a linear, additive, non-reciprocal manner. The Markov model assumes, on the other hand, that change operates according to the Markovian property, viz., probability of change is dependent upon the level of aspirations. The path model assumes that all relevant variables are included in the system of equations. The Markov model also assumes that all the variables are in the system--only the model assumes that no other variables are relevant.

In terms of the analysis of change, the path model assumes that the temporal orderings of the variables are established. Changing variables earlier in the system is assumed to produce corresponding linear changes in the variables that are causally determined by them. The Markov model, on the other hand, assumes changes are a result of "random shocks," or particularistic factors. The simple model does not try to delineate these factors, but only accurately predict their effects. The path model, on the other hand, deals with these causal factors by use of treating lagged variables as separate variables in the system, although this creates some methodological problems such as the possibility of correlated error terms, and colinearity.

We see, therefore, that both models deal with the distinction between the level of aspirations and changes in the level. This distinction is of interest because factors that affect the level may not affect change in aspirations. At any given point in time, the level of aspirations may be more a result of the more stable characteristics of the student. These factors may include intelligence, parental education, and family status. On the other hand, later aspirations may be more influenced by past aspirations and situational factors such as significant others' support (Williams, 1972; Rehberg and Hotchkiss, 1972).

While both models have their advantages, the Markov model has the advantage of permitting the use of dichotomous data. It also focuses directly on the prediction of specific types of changes in aspirations. While the simple model does not deal with factors affecting changes in aspirations, it does permit analysis of the regularities of these changes.

The purpose of this study is to (1) test the predictability of the changes in aspirations using the simple, two-state, discrete-time Markov model,[2] and (2) to test for differences in selected background characteristics for students with different patterns of aspirations.

THE MARKOV MODEL

In this section the basic properties of the simple Markov model will be described. After this description, the model's assumptions will be discussed in relationship to educational aspirations.

The discrete-time Markov chain describes a stochastic process with a finite number of states and a discrete time domain. It is characterized by a set of states, a probability distribution over the states at each time t, and a square matrix of transition probabilities.

If X_i is a random variable whose values represent any of n discrete states occupied by the system of time t (where t are discrete times), and if a finite number of states exist, then the sequence of observations of X_i over time is a Markov chain if the probability that X_i takes on any value depends on the previous value (assuming a first-order process), and on nothing else in the history of the variable. This is called the Markov property.

The model used assumes that change is dependent on the time interval involved, and not only on the existence of any particular time period. This is the time-homogeneity or stationarity assumption of the model.

In addition it is assumed that the individual member represents a randomly selected individual from a population. Members of the population are here assumed to be subject to the same transition probabilities, and that the population transition matrix applies to any randomly selected individual.

The set of probabilities at time t the system is in state i given that at time t-1 the system was in state j is called the transition probabilities of the model. These are calculated by recording the movements of random variables over time. When the movements are arranged in tabular form the estimates of the probabilities, p_{ij}'s, are obtained by dividing the cell frequencies by the row totals. For a two-state system the form of the transition matrix is:

$$P = \begin{bmatrix} p_{11} & p_{12} \\ p_{21} & p_{22} \end{bmatrix}$$

where p_{12} represents the probability of movement from state 1 to state 2 from time t to time t + 1, and so forth.

One feature of this Markov model is that one can determine the higher transition probabilities, p^n. Given the initial distribution of the system, one can determine the future distribution of the system by raising the one-step transition matrix to its appropriate power (which is the interval of time desired). This is a direct result of the independence of the process of the time interval. Given a sufficient time interval the rows of the matrix will become identical. This is the "steady state" of the process. In this state the relative numbers in each state can be used as a measure of the relative sizes of the transition rates. The stability of the population process rarely depends on the stability of the individual changes (Stinchcombe, 1968).

Relating the model's assumptions to the aspirational process we see first that the model assumes individuals are random replicates (one replaceable by another). This is no problem if heterogeneity is not present in the population such that the students are not subject to the same transition probabilities. This is clearly a somewhat restrictive assumption, since individuals may be subject to their own probabilities. At the group level, nonetheless, this assumption could be quite reasonable. The population transitions may be viewed, then, as a weighted average of all the individual transitions.

The model also assumes that it is the time interval that is important, and not the particular point in time. This assumption could also be somewhat restrictive, since there may be crisis periods during the high school years that produce changes in the probability of changes in aspirations. For example, the freshman-sophomore transition may be a crisis period where students are suddenly placed into a new and demanding atmosphere. On the other hand, the influence of time itself may be more important than any period. The longer the time spent in school, the greater the opportunities for more realistic evaluations of aspirations. Through time students may learn to accept these evaluations, and adjust their aspirations accordingly. Agents of this change could be significant others, grades, and standardized achievement tests.

Finally, the model assumes that what is necessary to know to predict change is the past state alone. Length of time with a given aspiration level is not assumed important. This assumption does not seem unreasonable. Given that past levels of aspirations are a determinant of how significant others respond to students, it seems quite reasonable to assume that level of aspirations rather than length of time having any level of aspirations is important. It would seem unlikely that teachers or parents would consciously respond to the past history of aspirations.

Another possible explanation for the Markovian (ahistorical) nature of the process could be the similarity of students who at any point in time have similar levels but differing histories of aspirations. The process could then be ahistorical because change is influenced by these similar characteristics. For example, students with advantaged backgrounds tend to have higher aspirations than those who are not so advantaged. Being advantaged itself could influence the probabilities of change. Thus, the probabilities of change are not due primarily to the fact that a student has high aspirations, but that a student has an advantaged social background. This would suggest that the system operates not just in response to aspirations, but to the characteristics that influence aspirations. This type of interpretation is suggested by the findings of both Williams (1972) and Rehberg and Hotchkiss (1972). They found that the early aspirations were essentially a product of background characteristics. These characteristics then indirectly influenced later aspirations by more directly influencing early aspirations.

METHOD

The data for this analysis are from an ongoing study of the industrialization of a rural area in a large midwestern state. As part of this larger study, each fall since 1966 the high school students in both the control and experimental area have been surveyed to monitor changes in attitudes, future plans, and behavior. As part of this survey students were also asked to report selected family characteristics. To date this procedure has generated six waves of observations--1966, 1967, 1968, 1969, 1970, and 1971. Data from the first four waves (N=615) were used to test the Markov model. Data from the first three waves (N=258) were used to test for differences between students with different patterns of aspirations.

Educational aspirations were measured for all but the first wave by responses to the question, "How far in school do you hope to go?" Students could check any of six categories. These were 1) less than high school, 2) finish high school, 3) vocational or technical school, 4) junior college, 5) four-year college or university, and 6) advanced degree. For the first wave students could respond to planned college attendance by checking one of four categories. These were 1) Yes, 2) Probably, 3) Probably not, and 4) No. For this analysis aspirations were coded into college and non-college aspirations. College aspirations were coded when a student responded wanting to attend at least junior college or probably attend college. All others were coded as non-college aspirations.

For the test of the Markov model data were organized by sex by year of graduation (cohort). Aspirations were cross-tabulated with the earlier time period on the row, and the later time period on the column. In all there were five one-year transitions, three two-year transitions, and one three-year transition. These are given in the tables in the Appendix.

For the study of the pattern of aspirations, educational aspirations were used to determine four groups of students. Students with reports of college aspirations over the three years observed (N=137) were called the "highs." Students with continued reports of non-college aspirations (N=49) were called the "lows." Students who by the final wave had raised their aspirations (N=30) were called "turned on," while those who had lowered their aspirations (N=42) were called "turned off." Differences between these groups were tested using the t-test. The variables used were the student reports of age, sex, parental education, father's income, peak expected income, self-rating of intelligence, parental support of college plans, teachers' encouragement for college attendance, and having a close friend planning on attending college.[3] The students' responses for the final wave of data were used.

As with other studies using panel data, differential response rates were apparent. For the 1968 graduating class (surveyed for their junior-senior period) 71% had complete data on educational aspirations. For the 1969 class (surveyed during their sophomore to senior years) 46% had complete information over the three years. For the 1970 class (the only class observed for the entire high school period) 48% had complete information. Complete data were available for 46% of the 1971 class (surveyed from their freshman to junior year), while 75% of the 1972 class (surveyed from freshman to sophomore years) had complete data.

T-tests of the differences between respondents and non-respondents revealed no significant differences that were either consistent across all class or were viewed as theoretically significant in terms of educational aspirations. Variables used to compare respondents and non-respondents included father's occupation, father's income, parental education, sex, age, and school attended.

TESTING THE ASSUMPTIONS OF THE MARKOV MODEL

There have been various methods suggested for testing the fit of empirical data and the Markov model (Hoel, 1954; Bartlett, 1951; Anderson and Goodman, 1957; Goodman, 1962). This study utilized the method suggested by Goodman (1962) which provided detailed analysis of the data while offering an alternative but accurate method comparable to the maximum likelihood estimation method. Goodman's method is applicable to multi-wave data and has as its primary purpose the discovery of any regularities in the data which would help in the prediction of any future state of the system. The testing procedure involves the use of X^2 goodness of fit tests assuming a discrete-time Markov chain of nth order. Large sample sizes and representative samples are assumed if inferences are to be drawn regarding population models.

The basic technique used is to test separate tables for each response category for each period for each stratum of interest. Separate tables are tested for their independence, and summing X^2 values and degrees of freedom permits the testing of constant transition probabilities for the entire process. The method involves testing successive hypotheses regarding the independence of responses, constancy of transitions, equality of stratum, and so forth. Using this method the following hypotheses were set up for testing at the 5% significance level.

(1) Responses in successive periods are independent for each cohort.

(2) The transition probability matrices are constant, assuming a first-order process, for each cohort.

(3) Males and females within each cohort are governed by the same process of change, assuming a first-order process.

(4) There is a general transition probability matrix, assuming a first-order process.

RESULTS

TESTS OF THE MODEL

The basic assumption of the Markov model is the dependence of the present state on the state of the system during the previous history. Therefore, the responses must be dependent over time. The first hypothesis is that responses over periods were independent. The hypothesis of independence is easily rejected as there was obvious lumping on the diagonals of the cross-tabulations for all the transition tables (See Appendix).

The second hypothesis tests the assumption that the transition probability matrices are the same for any given period within each cohort assuming the process is first order. This hypothesis was tested for both males and females.[4] Since at least three waves of observations for any panel are needed to test this hypothesis, the 1969 to 1971 cohorts were used in this analysis.

The results of this test are given in Table 1. None of the X^2 values for the data was significant at the 1% level. Since none was significant, the hypothesis of constancy of transitions was not rejected. That is, the fit of the Markov process model for each sex within each of the tested cohorts was not rejected. This means that aspirations appear to act as variables for which the future state depends only on the present state and nothing else in the history. The rates are not time-dependent and are constant for the aggregate of both males and females within each cohort.

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(Insert Table 1 about here)

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The third hypothesis was that the same process of change with the same rates characterizes both males and females. That is, treating males and females as separate stratum is unnecessary.

In Table 2 the results of the tests of this hypothesis are given. None of the X^2 table values was significant at the 1% level. Therefore, the null hypothesis of no sex differences in the actual rates of turnover cannot be rejected on the basis of the evidence presented. This would seem to indicate that while males and females may significantly differ in their general levels of aspirations, they do not differ in terms of the process of changes in the aspirational levels over time.

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(Insert Table 2 about here)

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The constancy of transition probability matrices for each cohort was tested after pooling males and females. This was done to check the hypothesis of constant probability matrices which would have been carried out had the sample not originally been separated in male and female substratum. The results of this test are found in Table 3, and support the hypothesis of constancy previously supported separately for males and females. In addition, this test permits the final test of the applicability of the Markov model.

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(Insert Table 3 about here

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The last hypothesis is a test of the general extension of the fit of the model where all the data have been treated as one homogeneous population. That is, that each of the nine tables could be represented by the same process of change with the same rates of turnover. To test this hypothesis the X^2 was based on each period for each cohort over each category of response (college and non-college). With 8 degrees of freedom the value found for the table was 15.36 for the high category, and 6.71 for the low category. Neither of these values is significant at the 1% level. The null hypothesis of no differences among cohorts for the process was, therefore, not rejected.

GENERAL TRANSITION MATRIX

Since there were no significant differences among cohorts between sexes and over time, the data were combined into one one-step transition table. This table was then used to determine the estimated turnover probabilities for the various transition periods, P^n. The general transition matrices for the data are given in Table 4. Here P^1 represents the one-year transition probabilities, P^2 the two-year transitions, and P^3 represents the three-year transition probabilities. P^n is the stable state vector and represents the "final" distribution of college and non-college aspirants if the process were allowed to continue to a state of equilibrium (here at N=12).

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(Insert Table 4 about here)

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As a further test of the model post hoc prediction (as used by McDill and Coleman) were carried out using the X^2 goodness of fit test to determine the degree of correspondence between the predicted and actual distributions of aspiration states over time. None of the nine actual distributions differed from the predicted distributions using the 1% level of significance, although the two-year transition for the 1969 cohort was significantly different from the predicted distribution at the 5% level.[5] On the basis of this general correspondence the fit of the data and the model appear to be quite acceptable.

THE PATTERN OF ASPIRATIONS

The pattern of aspirations was used to more directly test the similarity of background characteristics which mav be responsible for the Markovian nature of aspirational change. For this analysis the four groups of students (N=258) with different patterns of aspirations were used. Differences were tested using the t-test at the 5% level of significance. The means for the four groups are presented in Table 5.

Support for the hypothesis of similar background would be obtained if those with constant college aspirations ("highs") were similar to those who upgraded their aspirations ("turned on"), and if those who continually reported non-college aspirations ("lows") were not significantly different from those who lowered their aspirations ("turned off").

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(Insert Table 5 about here)

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As predicted, the "lows" group did not differ significantly from the "turned off" group on any of the variables tested. For both groups the students seemed from more disadvantaged backgrounds as shown by the low parental education and low father's income. These students also tended to have low expected peak incomes, low self-rating of intelligence, and low support of significant others' support of college plans.

The "highs" group did not significantly differ from the "turned on" group on any of the variables tested, except for self-ratings of intelligence. Students with constant reports of high aspirations had higher ratings than those who increased aspirations. As a whole both groups of students had more advantaged backgrounds, although they did differ in self-concept of intelligence. These students had parents with high education levels, high father's income, high peak income expectations, and high levels of significant others' support of college plans.

It appears, therefore, that students with different histories of aspirations for a given "final" aspirational level do not tend to differ from each other in important background characteristics such as parental education, father's income, sex, income aspirations, and significant others' support. As previously mentioned, the process of aspirational change may be ahistorical in nature because of this similarity of backgrounds. Differential rates of change may be due not just to the level of aspirations, but also to the characteristics of those who have these aspirations.

The findings of Williams (1972) and Rehberg and Hotchkiss (1972) suggest that the mechanism of change for aspirations is influenced by significant others (especially the parents), where future aspirations are mediated by differential support. Support for the importance of this influence was also obtained in this study. Students who lowered their aspirations differed from students who maintained high aspirations only on the variable of parental support of college plans. Students with lowered aspirations had lower support. In addition, students who had increased their aspirations differed from students with continued low aspirations only on the variable of parental support. Students who increased their aspirations had higher levels of parental support. These findings suggest that parental support of college plans is an important determinant of aspirational change.

SUMMARY AND CONCLUSION

The two-state, discrete-time Markov model accurately predicted the changes in educational aspirations (college/non-college) for the high school students sampled.

There appears to be differential turnover between college and non-college plans. The probability of lowering one's aspirations was less than the probability of increasing one's aspirations. This difference tended to increase over time. The model predicts that over the first year of those who initially wanted to attend college about 18% would change their minds, while 24% of those who had initially not wanted to attend college would change their minds. By the second year 28% of the original group would have lowered their aspirations, while 38% of the low group would not plan on attending college. By the third year 34% of those who had three years earlier wanted to attend college are predicted to lower their aspirations, while 46% of the original low group are expected to raise their aspirations. Given a significant period of time the model predicts that regardless of the initial distribution of aspirations 57% of all students would want to attend college, and 43% would not.

Students who had a given level of aspirations but different histories of aspirations were similar in selected background characteristics such as family status, significant others' support, and income aspirations. This finding suggests that the ahistorical nature of the aspirational process may be a function not only of the level of aspirations but also the general characteristics of students with those aspirations.

The assumption of stability in aspirations is clearly supported and the process appears to be Markovian in nature with one general process in operation over all the high school years. The nature of this process clearly operates to foster movement toward or retention in states of high aspirations as a whole, and also tends to force movement out of what may be more "unrealistic" levels of aspirations for selected students. This movement appears a result of significant others' influence, especially the parents.

Finally, a more definitive investigation of the factors influencing the differential turnover of aspirations must await the use of panel data with the turnovers themselves as the dependent variables. In this manner the process of change may be more adequately studied than in the analysis presented here.

FOOTNOTES

*This article is based in part on the author's master's thesis (Educational Aspirations of Rural Community High School Youth. Unpublished M.A. thesis, University of Minnesota, 1971). The author would like to express his sincere gratitude to Gene F. Summers and John P. Clark, principal investigators of the Rural Industrial Development Project for their kind permission to use their data. This project is supported by the National Institute for Mental Health PHS Research Grant MH-19689, and by the Graduate Research Board, University of Illinois, Urbana.

[1]Although I can quote no exact number of studies, the number is quite large. One study, for example, based their hypotheses on a review of over 200 studies. See Rehberg and Westby (1967:362). For studies with extensive references see Sewell, Haller, and Straus (1957); Haller and Butterworth (1960); Sewell (1964); Sewell and Armer (1966); and Sewell and Shah (1967; 1968).

[2]At this point it should be noted that even if changes in aspirations can be predicted using the Markov model, it is only one of many possible models that may accurately predict change. The underlying process may not be truly Markovian, but may, in the short run, act like one.

[3]The coding for these variables were as follows: Incomes were coded from 0 to 9 with 0 for under $2,500, 1 for $2,500 to $4,999, 2 for $5,000 to $7,499, 3 for $7,500 to $9,999, 4 for $10,000 to $12,499, 5 for $12,500 to $14,999, 6 for $15,000 to $19,999, 7 for $20,000 to $24,999, 8 for $25,000 to $29,999, and 9 for $30,000 and over. Intelligence self-rating

was measured by rating the statement "Generally I am intelligent" on a ten-point scale with 0 as "definitely does not describe me" to 9 for "definitely describes me well." Education was measured by the student's report of how many years of education parents completed, and significant others' support was measured by asking the student if his parents, teachers, and friends supported his college plans and was coded 1 for no support and 2 for support.

[4]It should be noted that the test of the order of the Markov chain was done, but the results were only suggestive. Goodman suggests the use of X^2 test to test the order of the chain. However, Guthrie and Youssef (1970) have found that the method is most valid only with large sample sizes, and the estimated level of significance seems much higher than the theoretical level. With these data because of the small cell sizes the order of the chain could only be tested using the Fisher Exact test, and the results are, therefore, only offered as suggestive. Only for males in the 1971 cohort was there evidence of a second-order process at the 1% significance level. There was some evidence of a second-order process for females in the 1969 and 1970 cohorts (with probabilities of .05 and .03), but only for those in the high aspiration category. Turnover for females with high consistent aspirations was invariably low (around 10%) compared to females with low aspirations (around 50% probability of change). Assuming the adequacy of the testing procedure it would appear that there is some patterning of aspirational influences on future aspirations for females with high aspirations. It appears that once females are committed to high achievement they are very reluctant to change their plans.

[5]Tests were carried out on all nine transition tables. The lack of fit in the 1969 sophomore-senior transition was due to a greater number of college aspirants not changing their mind over the two years.

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Table 1. The X^2 Table for the Test of the Hypothesis of Constant Transition Probabilities*

Cohort	Transitions	Sex	d.f.	Responses High	Responses Low	Total
1969	So-Jr-Sr	Male	1	.13	2.80	2.93
		Female	1	.88	.42	1.30
1970	Fr-So-Jr-Sr	Male	2	4.27	.42	4.69
		Female	2	1.42	.77	2.19
1971	Fr-So-Jr	Male	1	.86	.23	1.09
		Female	1	.05	.36	.41

*The values were corrected for contingency where necessary.

Table 2. The X^2 Table for the Test of the

Hypothesis of No Sex Differences for the Process of Change

			Responses		
Cohort	Transition	d.f.	High	Low	Total
1968	Fr-So	1	.06	.02	.08
1969	So-Jr	1	1.05	.89	1.94
	Jr-Sr	1	.18	2.32	2.50
1970	Fr-So	1	.02	.01	.03
	So-Jr	1	.00	.12	.12
	Jr-Sr	1	.62	.05	.67
1971	Fr-So	1	.00	.20	.20
	So Jr	1	1.07	.36	1.43
1972	Fr-So	1	.25	.13	.38

Table 3. The X^2 Table for the Test of the Hypothesis of Constant Transitions for the Total Sample Within Cohorts

Cohort	Transitions	d.f.	Responses High	Responses Low	Total
1969	So-Jr-Sr	2	1.34	.13	1.47
1970	Fr-So-Jr-Sr	4	4.15	1.34	5.29
1971	Fr-So-Jr	2	.43	.06	.49

Table 4. The One-, Two-, and Three-Year Transition Matrices and the Stable State Vector for the Discrete-Time Markov Model*

$$P^1 = \begin{bmatrix} .81 & .179 \\ .239 & .761 \end{bmatrix}$$

$$P^2 = \begin{bmatrix} .717 & .283 \\ .378 & .622 \end{bmatrix}$$

$$P^3 = \begin{bmatrix} .656 & .344 \\ .459 & .541 \end{bmatrix}$$

$$P^n = \begin{bmatrix} .572 & .428 \end{bmatrix}$$

*The system approaches equilibrium at about n = 12.

Table 5. Means on Selected Background Variables for Groups with Different Aspirational Patterns from 1966 to 1968

Variables	Highs	Lows	Turned Off	Turned On
Expected Income	5.4	3.1	3.4	3.9
Age	16.3	16.2	16.2	16.5
Percent Female	47	63	58	53
Mother's Education	12.3	10.7	10.8	11.5
Father's Education	12.3	9.8	9.7	11.1
Father's Income	3.8	3.2	3.1	3.3
Intelligence Rating	6.8	5.3	5.5	5.3
Parental Support	2.0	1.3	1.5	2.0
Friends' Support	1.8	1.4	1.6	1.8
Teachers' Support	1.9	1.4	1.7	1.9
Group Size	137	49	42	30

APPENDIX

Table 6. The One-Year Transition
Table for the 1968 Graduating Class

		Senior Year		
		High	Low	Total
Junior Year	High	69	17	86
	Low	5	40	45
	Total	74	57	131

Table 7. The One- and Two-Year
Tables for the 1969 Graduating Class

		Junior Year		
		High	Low	Total
Sophomore Year	High	72	12	84
	Low	10	30	40
	Total	82	42	124

		Senior Year		
		High	Low	Total
Sophomore Year	High	72	12	84
	Low	17	23	40
	Total	89	35	124

Table 8. The One-, Two-, and Three-Year Transition Tables for the 1970 Graduating Class

		Sophomore Year		
		High	Low	Total
Freshman Year	High	64	22	86
	Low	10	31	41
	Total	74	53	127

		Junior Year		
		High	Low	Total
Freshman Year	High	61	25	86
	Low	12	29	41
	Total	73	54	127

		Senior Year		
		High	Low	Total
Freshman Year	High	63	23	86
	Low	16	25	41
	Total	79	48	127

Table 9. The One- and Two-Year Transition Tables for the 1971 Graduating Class

		Sophomore Year		
		High	Low	Total
Freshman Year	High	53	12	65
	Low	9	22	31
	Total	62	34	96

		Junior Year		
		High	Low	Total
Freshman Year	High	53	12	65
	Low	10	21	31
	Total	63	33	96

Table 10. The One-Year Transition Table for the 1971 Graduating Class

		Sophomore Year		
		High	Low	Total
Freshman Year	High	99	23	122
	Low	8	37	45
	Total	107	60	167